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Author(s): McDonald, Rebecca E.

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# Bioscience Division Overview



# Mission :

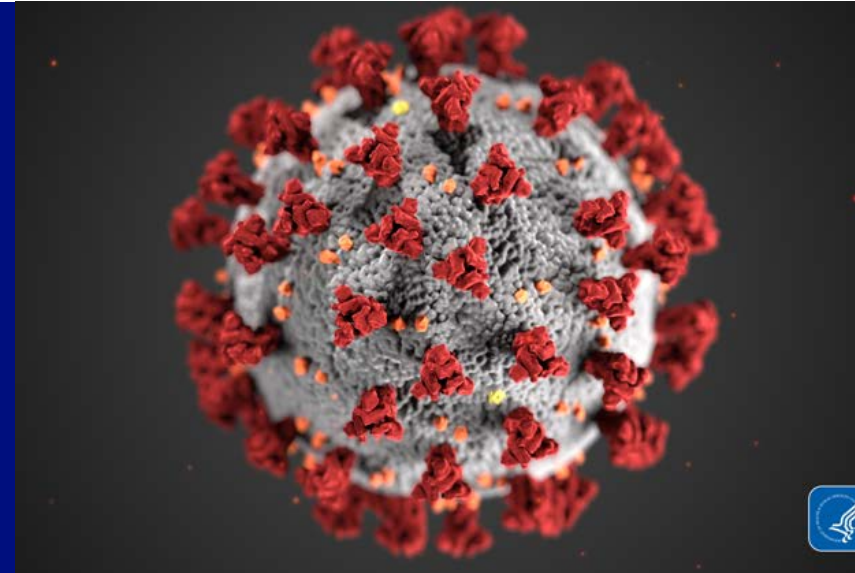
## Reducing threats to populations, their way of life, and the global environment

### Capabilities

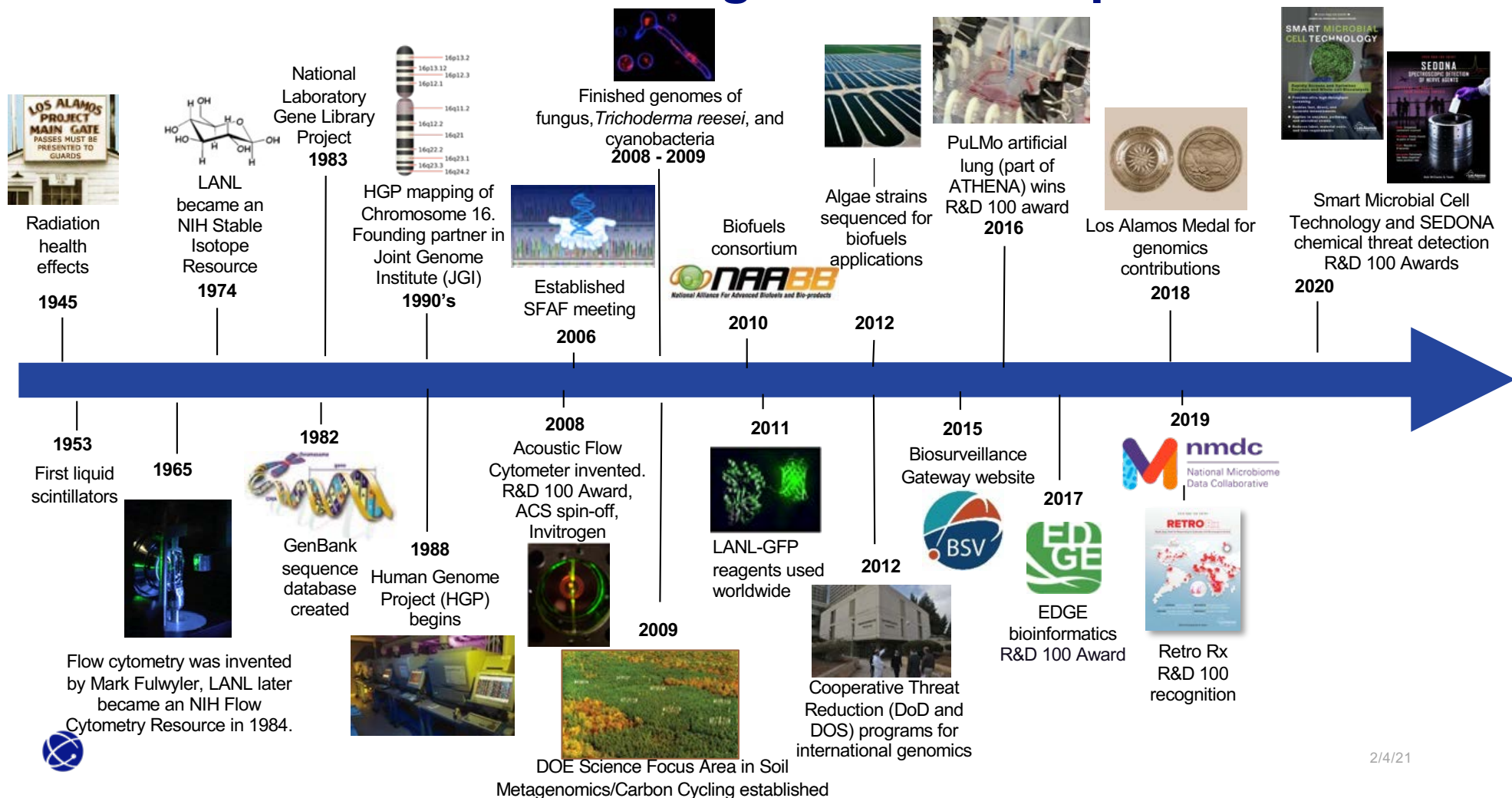
- Integrated genomics
- Biochemistry
- Structural biology
- Synthetic biology
- Host pathogen biology

### Focus Areas

- Biofuels, biomaterials, and biosynthesis
- Terrestrial biosystems and environmental impacts
- Biosurveillance
- CB threat science
- Health effects and countermeasures



# LANL contributions to biological science span decades





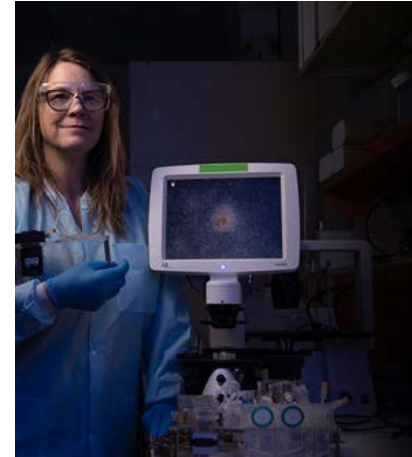
# Biosecurity and Public Health Group (B-10)



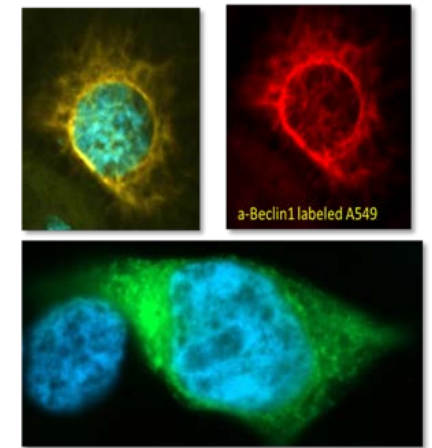
Next generation genomics



Health analytics and bioinformatics development



Bioengineered platform development



Bacterial persistence and antibiotic resistance studies

## Bioinformatics and Genomics Team

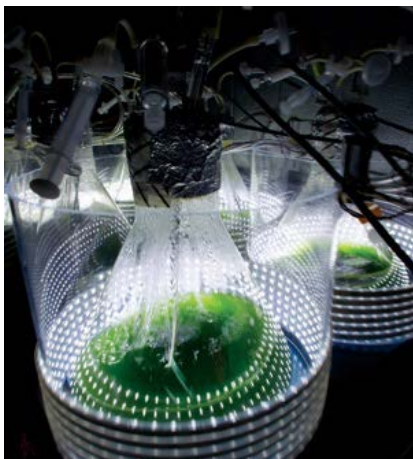
- 8 Scientists
- 7 Postdocs
- 8 Technicians/technologists
- 9 Students
- 4 Software developers, 2 project managers

## Host and Pathogen Biology Team

- 7 Scientists
- 5 Postdocs
- 8 Technicians/technologists
- 10 Students



# Bioenergy and Biome Sciences Group (B-11)



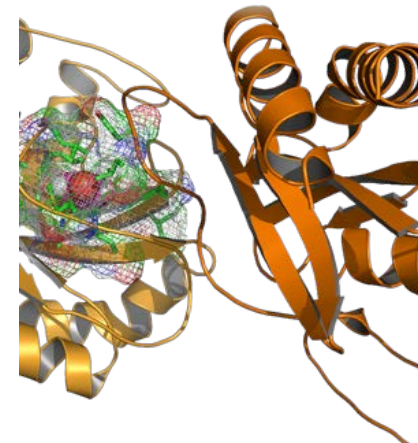
Biofuels and bioproduct development



Microbial ecology studies on carbon cycling and soil functioning



CB threat science and sensor development



Computational protein structure design

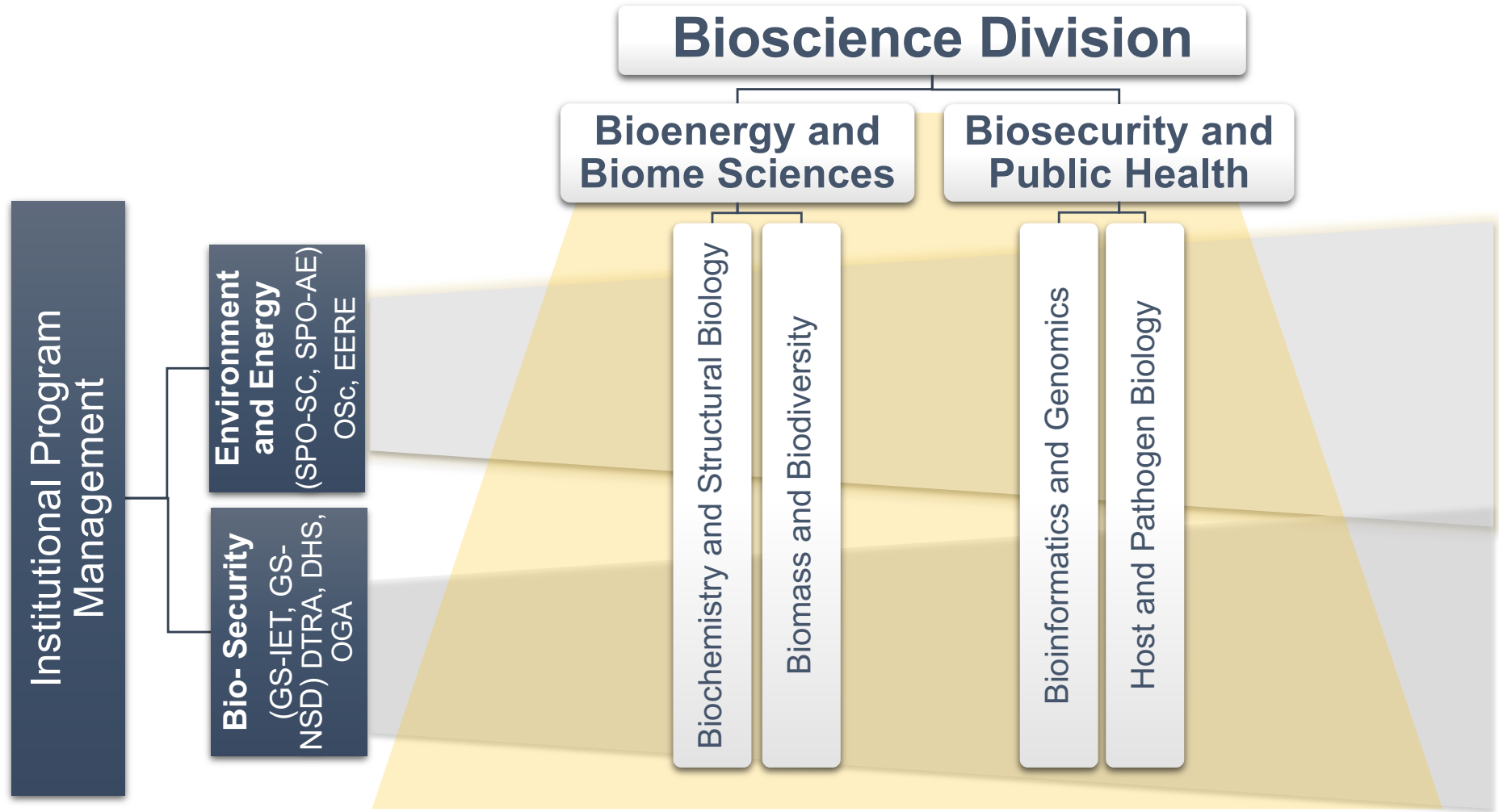
## Biomass and Biodiversity Team

- 9 Scientists
- 9 Postdocs
- 5 Technicians/technologists
- 12 Students

## Biochemistry and Structural Biology Team

- 13 Scientists
- 7 Postdocs
- 3 Technicians/technologists
- 4 Students







# Selected publicity highlights



## Bioplastics feature

LANL's 1663 magazine published a feature story on multiple biomanufacturing efforts in B Division.



## RETRO-Rx Podcast

R&D World hosted a podcast with Alina Deshpande on responding to infectious disease outbreaks and re-emergence events.



## Column on the NMDC

*Albuquerque Journal* featured a column by Bin Hu on the National Microbiome Research Collaborative (NMDC)



## Chemical threats

1663 magazine story about using ultra-low field nuclear magnetic resonance to identify chemical signatures



# Bioscience Division facilities



**TA 43 Health Research Lab (HRL)**

- TA-43 (HRL) net lab and office space
  - office space
  - BSL-2
  - BSL-2 Select Agent labs



**Research Park**

- Research Park
  - office space
  - BSL-1 labs, genomics capability



**TA 3-562 (NMR)**

- TA 3-562 (NMR)
  - office space
  - BSL-1 labs, NMR capability



**TA 35-85**

- TA 35-85
  - office space
  - BSL-1 labs, chemical synthesis capability



**Bioscience Research Lab (BRL)**

- Bioscience Research Lab (BRL)
  - office space
  - BSL-1 & BSL-2 labs



**Emerging Threat Lab (ETL)**

- Emerging Threat Lab (ETL)
  - office space
  - BSL-2 select agent labs, high hazard chem capability

**BRL and ETL occupancy is expected in 2021**



# Responding to COVID-19

- Testing of COVID samples for LANL staff and beyond
  - 1000 tests/week (goal). Led out of Bioscience Division
- R&D Next Generation Testing
  - Improved detection and diagnostics using
    - Genomic analysis (EDGE bioinformatics)
    - Affinity reagents and structure-based protein design
- Medical countermeasures
  - Small molecule therapeutics and affinity reagents
  - Host-pathogen studies and lung-protective therapies
- Modeling and forecasting disease spread
  - AIDO, MEDIAN, EpiCast, and more
- Biosurveillance Gateway website showcases tools and capabilities
- LDRD Rapid Response call funded 6 projects across Divisions

